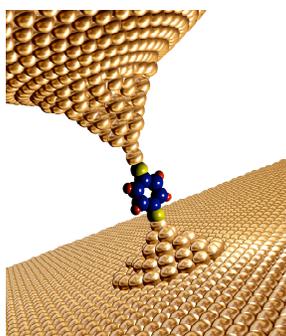




## MSD Investigator Honored by Venture Capital Firm *Segalman Recognized for Technological Promise*



MSD Faculty Scientist Rachel Segalman has been honored with an Innovator's Award by the Silicon Valley venture capital firm Mohr Davidow Ventures (MDV). This award recognizes extraordinary Stanford and Berkeley scientists who are early in their career or have recently made a career transition, for their innovative approaches to major scientific and technical challenges in energy and materials. Awardees receive funding to support a one-year exploratory project that has the potential to either have a disruptive impact on an existing field, or to create a new field of study or technology development.

Segalman's award is based on her work in the area of nanostructural control and self-assembly of soft materials for energy applications. In recent work, she, in collaboration with Materials Sciences Division investigator Arun Majumdar, discovered thermoelectricity—the conversion of heat to electricity—in devices with a single molecule sandwiched between two metal surfaces. This is an important step towards the use of (often wasted) heat to generate electrical power.

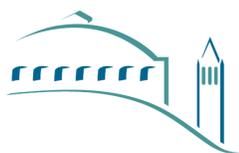
The award is an illustration of the impact MSD's basic research efforts can have on technology development. In another example, over the last 15 years, MSD-developed technology has served as the basis for commercially successful start-up companies whose aggregate market value now is estimated to approach \$1.5 billion.



MOHR DAVIDOW VENTURES

*Mohr Davidow Ventures conceived the Innovators Award program to encourage new and "disruptive approaches" which could have a potentially high impact on important research and technological challenges. For 25 years, this leading Silicon Valley-based venture capital firm, has identified, mentored and developed entrepreneurs and young companies redefining business, technology and medicine. MDV invests in three major themes: Powering the Planet; Personalizing Medicine; and Driving the Digital World.*

R. Segalman (510-642-7998), Materials Sciences Division (510-486-4755), Berkeley Lab.



## Innovation Awards for Segalman and Pines

### *MSD Investigators Recognized for Technological Breakthroughs*

Two MSD investigators received recognition this month for technical innovation. MSD Faculty scientist Rachel Segalman was recognized by *Technology Review Magazine* as being among the world's "Top Young Innovators" under the age of 35 for discovering that inexpensive organic molecules can be used to generate electricity from heat. Also, MSD Senior Faculty Scientist Alex Pines was selected as one of *R&D Magazine's* top 100 innovators for his development of magnetic resonance imaging techniques that could eliminate the need for powerful magnets.

Each year, *Technology Review*, the oldest technology magazine in the world, announces its "TR35" list. The list recognizes innovators under the age of 35 in business, technology and the arts. In the course of her research on understanding the basic relationship between polymer structure and properties, Segalman developed materials that self-assemble into a desired structure, such as a flexible plastic sheet, which can produce energy from sunlight. In collaboration with MSD researcher Arun Majumdar, she studied how individual polymer molecules can generate voltage when one end is heated, opening the door to using heat to generate electrical power. This measurement also provides significant insight to the fundamental electronic structure of molecules which is notoriously difficult to decipher using existing conductance measurements. Though the power produced so far is small, she is working on scaling up using mixtures of composites and nanocrystals to make "thermoelectric" devices that might be able to scavenge waste heat or sunlight for power.

Also this month, *R&D Magazine* announced its annual R&D 100 awards. Among the honorees was Alex Pines, who was recognized for his invention of laser-detected magnetic resonance imaging (MRI). MRI is a powerful technique for a variety of applications, but the need for a large and powerful magnet and expensive support systems has limited its usefulness. Pines has been a leader in the MRI field for decades and recently developed, in collaboration with LBNL scientist Dmitry Budker, a laser-based MRI detection method that eliminates the need for a high-field magnet. This new technology could soon enable MRI to image a wide range of phenomena, from petroleum reservoirs to very small objects such as tissue samples and microfluidics. In contrast to a typical high-field MRI system that might cost \$1 million and weigh 10,000 pounds, the so-called Laser-Detected MRI might sell for \$30,000 and weigh less than 100 pounds.

These two prestigious awards illustrate the importance of MSD's basic research efforts to technology development. Over the last 15 years, MSD-developed technology has served as the basis for commercially successful start-up companies whose aggregate market value now is estimated as approximately \$1.5 billion.